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ABSTRACT

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LEARNING OF INFORMATION IN TELEVISION COMMERCIALS BY
GIFTED, NORMAL, AND EMR CHILDREN

Donald W. Hendon, Frances M. Duncan, and Brenda L. Hendon

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Introduction

There are indications that both program and commercial content of television are effective learning tools. TV shows have been used in Philadelphia to help children to read. They watch programs in class while following a written script. Preliminary reports indicate effectiveness. (Corpus Christi Caller, 1973) Louisville's River Region Mental Health/Mental Retardation Board is using public service ads on TV to promote emotional stability. (Advertising Age, 1973) Sinclair (1974) uses "bursts" of up to 90 seconds to teach college students. TV programs and ads have demonstrated reinforcing properties (Greene & Hoats, 1969; Lindsley, 1962; Nathan & Wallace, 1965), and the literature of advertising effectiveness abounds with discussion of recognition tests, recall and association tests, opinion and attitude ratings, projective methods, laboratory testing, content analysis, inquiries, and sales measures. Many different models of advertising effectiveness have been proposed (Hepner, 1949; Schramm, 1954; Cox, 1961; Colley, 1963; Nicosia, 1966; Howard & Sheth, 1968; and Varbrough, 1968), all of which have many elements in common with learning models. Just as advertising theorists have borrowed from learning theory, Sesame Street has borrowed many techniques from TV commercials, including (1) short messages, (2) continual repetition or distributed practice, (3) realistically executed fantasy, (4) emphasis on motion rather than on static pictures or verbiage, (5) scenes demonstrating how reward/enjoyment results from using the "product," and (6) scenes emphasizing the "product" itself. Wells (1965)

reports that children's TV ads which include points (3) through (6) achieve relatively greater effectiveness.

Are some techniques, including the four suggested by Wells, more facilitating than others? Film (1971) used a form of content analysis to correlate content of TV ads with interest and Striefel and Smeets (1974) have suggested the use of their "preference technique" to explore the different variables within a preferred children's program to determine what the reinforcing components of the preferred program are. Such components could then be used to develop educational TV programs.

While similar methodology could be used to determine reinforcing components of TV commercials, the effectiveness of commercials as learning tools must be predetermined. This is the purpose of the study. It attempts to answer the four following questions: -Do TV ads facilitate the learning of information by children? Is there a difference in the amount of information learned by children of different intelligence levels, of different ages, and of different sexes? Is intelligence, age, or sex more important in learning this kind of information? Should children-directed TV messages be simplified or complicated, repeated more or less often to improve learning of information? Desire for products advertised, another element common to most advertising effectiveness models, along with memory of information learned, is also important. Thus, the four questions may be applied to desire as well. In answering the eight questions, the relationships between intelligence, age, and sex (three independent variables) and learning and desire (two dependent variables) are explored.

Theory and Hypotheses

Introduction

This study is concerned with normal, gifted, and EMR children.

Operational definitions follow Terman & Merrill (1960) for normals (I.Q. 90-110), and Kirk (1972a) for gifteds (I.Q. 115+) and EMRs (50-55 to 75-79). Kolstoe (1972) suggests that memory, generalizations, incidental learning, and social learning are important to EMRs. As can be seen in the next paragraph, all but the latter influence the choice of the first null hypothesis: "There is no significant difference between normal and EMR children in their response to TV ads aimed at children. 'Response' is defined operationally in two ways: (1) memory of content of TV ads, and (2) the degree to which children insist their mother purchase the product advertised, or degree of insistence (DI)."

In regard to memory, Ellis (1963) found that once mentally retarded children "catch on" to what is required, they learn as rapidly and as skillfully as normal children, especially in the long-run. Most TV ads are repeated often over time. However, retardates waste more time in random, trial-and-error efforts than normals in initial learning stages. Das (1977) reports that normal and retarded children use distinct modes of coding information. However, when category labels are readily available and "spoon-fed" to retardates, there is no difference in learning rate, in efficiency in reducing information, in information storage, and in memory. Labeling occurs in TV ads, most of which stress product identification very strongly. Generalization occurs either by rote or by using principles. Brown, McKay, and Rainey (1964) found that retarded children learn better by rote. In children's TV ads, slogans and jingles (rote) are more numerous than demonstrations (principles). Williams (1968) found that the retarded are not inferior to normal children in incidental learning. TV ads are probably incidental and not substantial to the majority of Americans. Gregasz (1965) found that advertising is not important to most Americans,

and Ward (1972) found that only 7% of children show high awareness of the purpose of TV ads--to sell goods and services. In tasks more complicated than incidental learning, however, normal children outperform retardates, rather consistently, and Das (1972) reports that normal children's performance on a series of cognitive tasks was superior to the retarded in each task. Although it is possible that TV ads may not be learned incidentally, the content of information conveyed by normative instructional media (lectures and textbooks) is relatively complex and sophisticated compared to TV ads.

Gifted children consistently exhibit superiority to normal children in memory, generalization, and incidental learning. Kirk (1972a) lists several characteristics of gifted children which influence the choice of the second and third null hypotheses: "There is no significant difference between gifted and normal children in their response to TV ads aimed at children," and "There is no significant difference between gifted and EMR children in their response to TV ads aimed at children." While the gifted child's superior reasoning ability, wide range of interests, intense drive in intellectual pursuits, and superior observance suggest a faster learning rate, two factors suggest the two learn at the same rate: (1) The gifted child's insatiable curiosity makes him want to know why. Gifteds may be frustrated by the relative lack of "why"-type information in ads, leading to cognitive dissonance and disremembering. (Festinger, 1957) (2) The gifted child requires less repetitions to learn, and learning increases with repetition. However, for some knowledge (ABC's, multiplication tables, etc.) forgetting does not occur. On the other hand, Grass (1968) reports a satiation effect after approximately 15 identical TV ads are seen, and which commercial information is disremembered by adults. Similar findings have been reported by Schwerin (1960a, 1960b) and Jakobovits (1967).

The learning of ABC's is not subject to the satiation effect because this kind of learning is important to school children--much more so than learning about ads. Therefore, if gifted and normals are exposed to the same ad the same number of times, the gifted may reach the satiation point of disremembering before the normals do.

Age

Many studies have indicated a positive correlation between age and intelligence. Piaget's (1963) stages of intellectual development theory states that children develop intelligently through five phases from 0 through 11-15 years. Conflicting evidence occurs in the literature concerning what accounts for variations in I.Q. with age. Hofstaetter (1954) concluded the major factor measured before age 2 was "sensorimotor alertness," "persistence" between 2 and 4 years, and "manipulation of symbols" beyond 4 years. Meyers and Dingman (1960) concluded that seven factors can be isolated in the 4-6 year range. McNemar (1942) concluded that one factor explained a large part of the performance on the Stanford-Binet test at each separate age but that the factor changed in nature over the age span. Using similar methodology, Jones (1954) concluded there were several factors which become more differentiated with age. Ward, Levinson, and Waskman (1971) report that as a child's chronological age increases, a decrease in IQ occurs. Ferguson (1973) reports that children are skeptical about TV ad claims, and the older they get, the more negative their attitudes toward TV commercials become. Ward (1972) reports that as age increases, more children understand the purpose of commercials, the level of complexity of recall increases, and fewer children believe ad content. Therefore, the fourth null hypothesis is: "There is no significant difference between younger and older children in their response to TV ads aimed at children."

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Sex

Boys and girls show no demonstratable differences in overall intelligence (Mussen, Conger, and Kagan, 1969). However, there are sex differences in the areas of greatest relative competence (Terman & Tyler, 1954). These differences become apparent only in adolescence (King, 1963). The later development of differences suggests that the sexes reflect differences in interest, rather than differential mental abilities, according to Elkind (1968). Therefore, the fifth null hypothesis is: "There is no significant difference between boys and girls in their response to TV ads aimed at children."

Methodology

All all-white sample of 54 gifted, 71 normal, and 53 EMR children (93 males, 85 females, 7-13 years) was selected on the basis of availability from first through sixth grade classes at 10 of the 43 schools in the Muscogee County (Georgia) school system, as seen in Table 1. Only whites were selected to eliminate possible differences due to race and socio-cultural background (Kirk, 1972b), although Barry & Hansen (1973) and Rendon (1973) found no differences between white and black children in their memory of TV ads. Officials of this urban school system placed the children in the three categories according to I.Q.'s, although I.Q.'s were not revealed to the researchers. Since gifted children are first identified in the fourth grade, gifted children of 7 and 8 years were not identified.

One of the authors questioned the 178 children. The 29 questions dealt with the five most advertised cereals on the three local network affiliates on Saturday mornings for a four-month period immediately preceding the interviews, which took place in a three-week period in May,

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Table 1

Number of Children in Sample

Age	Total children, all I.Q. category			Gifted children			Normal children			EMR children		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
7	17	8	9	0	0	0	16	7	9	1	1	0
8	29	15	14	0	0	0	22	10	12	7	5	2
9	17	9	8	7	3	4	2	2	0	8	4	4
10	40	22	18	20	10	10	6	1	5	14	11	3
11	44	25	19	19	11	8	18	9	9	7	5	2
12	27	13	14	8	4	4	6	3	3	13	6	7
13	4	1	3	0	0	0	1	0	1	3	1	2
Total	178	93	85	54	28	26	71	32	39	53	33	20

1973. Local station logs were examined. Since cereal was the most heavily-advertised category, it was selected, thus eliminating product as a source of variation. Only heavy viewers (more than three hours during each of the previous two Saturday mornings) were interviewed. Subjects reported their viewing hours. Viewing time had a 3-4 hour range and a mean of 3.25 hours. No difference with respect to exposure to ads was assumed between the three populations, since it was impossible to control for amount of previous exposure to a given ad. Although the content of the ads within each cereal may have been different, each cereal was advertised approximately the same number of times during the four months.

Eleven questions were asked to measure memory of the cereal ads' content, while four questions were asked to measure DI. The structure of the questions eliminated yes-saying bias. Respondents showed positive memory only if they answered 8 or more questions correctly, while positive DI was limited to 100% correct responses to the four DI questions. However, DI could not be verified as the school district disallowed parent interviews. The t-test for significance ($p .01$ between two sample proportions) was used to test the difference in memory and DI in the three groups.

Results

Tables 2 and 3 show the number in each I.Q., age, and sex category with positive memory and DI respectively. Hypothesis 5 was supported, since neither the difference in memory or in DI between males and females was significant. In regard to intelligence, three comparisons were made--gifteds to normals, gifteds to EMRs, and normals to EMRs. However, because the absence of gifteds at the 7-8 age level and because Piaget's theory of development suggests a relationship between intelligence and age, the three comparisons must be made twice--once for the entire sample

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Table 2

Number of Children with Positive Memory

Age	Total children, all I.Q. category			Gifted children			Normal children			EMR children		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
7	2	2	0	0	0	0	1	1	0	1	1	0
8	14	7	7	0	0	0	10	3	7	4	4	0
9	4	3	1	2	1	1	1	1	0	1	1	0
10	21	12	9	15	8	7	2	1	1	4	3	1
11	26	14	12	14	8	6	9	4	5	3	2	1
12	18	9	9	6	3	3	5	2	3	7	4	3
13	1	1	0	0	0	0	0	0	0	1	1	0
Total	86	48	38	37	20	17	28	12	16	21	16	5

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Table 3
Number of Children with Positive Degree of Insistence

Age	Total children, all I.Q. category			Gifted children			Normal children			E Tot
	Total	Male	Female	Total	Male	Female	Total	Male	Female	
7	13	6	7	0	0	0	12	5	7	
8	20	8	12	0	0	0	16	6	10	
9	13	6	7	6	3	3	1	1	0	
10	31	17	14	10	9	9	4	0	4	
11	31	20	15	14	8	6	16	8	8	
12	20	10	10	8	4	4	5	3	2	
13	2	0	2	0	0	0	0	0	0	
Total	134	67	67	46	24	22	54	23	31	

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and again for the 9-12 age group. The study failed to reject Hypotheses 1, 2, and 3 for DI, while failing to reject only Hypothesis 1 for memory for the total sample. This is because only the difference in memory between normals and EMRs was insignificant, while all groups had an insignificant difference between them for DI. In the 9-12 year sample, the study failed to reject Hypotheses 1, 2, and 3 and failed to reject Hypotheses 1 and 2 for memory. In this sample, only the difference in memory between giftededs and EMRs was significant--all other pairings showed no significant difference.

Since there was no significant difference in DI between any of the three groups in both the total and 9-12 year samples, intelligence does not significantly affect DI. However, it seems to be a significant factor affecting memory, for a significant difference existed between both giftededs/normals and giftededs/EMRs in the total sample, and between giftededs and EMRs in the 9-12 year sample. A significant difference between giftededs and EMRs was obtained, but this was expected. In the total sample, there is a greater information processing distance between giftededs and normals than between giftededs and EMRs, for there was a significant difference between giftededs and normals, but not between normals and EMRs. Thus, age appears to be a significant mediating variable for memory, for when all children are older, there is no difference between any groups in either memory or DI (except for the expected difference between giftededs and EMRs in memory). When younger children are introduced into the sample, a significant difference appears between giftededs vs. normals for memory and continues for giftededs vs. EMRs.

Before drawing complete conclusions concerning age, Table 4 must be examined. It shows the percentages of positive memory and DI by different

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Table 4
Percentage of Positive Memory and Degree of Insistence by Age

Total Sample								
Age	7	8	9	10	11	12	13	12-13
Memory	11.8	48.3	23.5	52.5	59.1	66.7	29.0	61.3
DI	76.4	69.0	76.4	77.5	80.0	74.0	50.0	71.0
Normal Child Sample								
Age	7	8	9	10	11	12	13	12-13
Memory	6.25	45.4	30.0	33.3	50.0	83.3	0.0	71.0
DI	75.0	72.7	50.0	67.0	88.8	83.3	0.0	71.0

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age groups, for all three groups, and for normals only. An absence of giftedness in the 7-8 age groups did not seem to affect the results, for the same pattern was evident in the normal sample. In both samples, memory tended to increase with age, while DI was high for the youngest, dropped during the middle years, and rose to almost the same level as the youngest for the oldest group. If the 11-year olds (whose DI was relatively high) were eliminated, DI would have showed a slightly downward movement as age increased. This would be in accordance with the findings of Ward, Levinson, and Wackman (1971). In regard to age differences, it is necessary to compare 7-year-olds to 12-year-olds. The difference in memory is significant, but not the difference in DI. Because of the absence of giftedness at the 7-year-old level, the 7-year-old normals are compared with the 12- and 13-year-old normals. While the difference in memory is significant, the DI difference is not. "Thus, the study failed to reject Hypothesis 4 for DI but not for memory in both instances."

The relative importance of intelligence, age, and sex in affecting memory and DI needs to be examined. Sex seems to be unimportant, as it affects neither memory nor DI. In regard to age, no significant difference existed between young and old for DI, only for memory. This is shown in Table 5, which summarizes the findings with an "X" indicating significant differences and an "O" indicating none. O's are found throughout the DI portion of Table 5, indicating no significant difference for intelligence, age, or sex on DI. X's are found in five cells of the memory portion: the two cells comparing the 7-year-old group with the oldest groups in both the total sample and 9-12-year-old normal sample; the two cells comparing giftedness and normals in the total sample. This leads to the conclusion that age is relatively more important than intelligence in affecting

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Table 5

Significance or Insignificance of Differences Between
Several Mediating Variables

	Memory			Age 7-year to 12/12-13 year olds	Sex Male- Female
	Intelligence		Gifted- ENR		
	Normal- ENR	Gifted- Normal			
Total Sample	0	X	X	X	0
9-12 Year Sample	0	0	X	X (normals only)	0

	Degree of Insistence			Age 7-year to 12/12-13 year olds	Sex Male- Female
	Intelligence		Gifted- ENR		
	Normal- ENR	Gifted- Normal			
Total Sample	0	0	0	0	0
9-12 Year Sample	0	0	0	0 (normals only)	0

Note: X's = Significant difference

0's = No significant difference

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memory for children, for there was no significant difference between giftededs and normals in the 9-12-year-old group, and yet there was a significant difference between them in the total sample. Intelligence probably did not account for most of this difference, for 38 normals and 9 EMRs of 7 and 8 years of age were dropped in the 9-12-year-old group, and yet there was still no significant difference between normals and giftededs in this sample. The elimination of normals increased the proportion of giftededs in the 9-12-year-old group from 30.3% to 41.9%. A greater difference between giftededs and normals was expected when the proportion of giftededs to normals was greater, but the opposite happened--there was a 29.1% difference between the two intelligence groups in the total sample with its 30.3% gifted makeup. Therefore, age probably accounted for most of the difference.

Implications

The implications offer tentative answers to the eight questions posited at the beginning of this paper. First, the three independent variables did not affect DI, which was mostly positive (75.3% of the total sample). Second, sex is not a significant mediating variable for memory, and age is somewhat more important than intelligence for memory. Therefore, as children age, they will remember more strongly, regardless of their sex. If they are more intelligent as well, their memory will be somewhat stronger, but not proportionally as strong as the increase in age. In fact, memory increased 6.5 times as fast as age, from 7-12 years; during that 5 year period, age increased 71.4%, while the 66.7% positive memory at age 12 was 465.3 times greater than the 11.8% memory at age 7.

The third implication is concerned with TV commercials as learning tools. Usually TV advertising relies purposely upon the psychological phenomenon of identification for learning. That is, the child comes to think, feel, and behave as though the characteristics of the TV ad belong to him.

Identification is often an unconscious process which is very effective in changing behavior, or learning. In order for this process to occur, two conditions must be met. The child must want to acquire the attributes of the model, and he must believe that he and the model have some characteristics in common, such as age, sex, socioeconomic status, or goals, although the last is fairly abstract for an EMR child. The implication here is that the teaching materials need to be suited to the general socioeconomic level of the group, which is not always middle class. The content of materials needs to be at the appropriate chronological age level of interest rather than the mental age level of interest. Furthermore, the teacher can enhance the process by recognizing verbally the desirable characteristics and then by commenting on the acquisition of these characteristics by the child. Thus the teacher has borrowed from TV advertising technique number 5: scenes demonstrating how reward/enjoyment results from using the "product."

Are TV commercials learning tools? The Louisville and Philadelphia experiments are based on the proposition that TV commercial techniques help viewers learn to learn, perhaps because of Sesame Street's apparent success in helping pre-schoolers learn. This study indicates that TV ads help children learn a product name and remember the ad itself, but they have not been demonstrated to help children learn to learn.

Learning to learn, or learning set, is the ability of the child to become more efficient in problem-solving as a result of practice on similar but not identical problems. It includes the related skills of memory, transfer, incidental learning, and social learning. Of particular importance is memory which seems to be functionally deficient in the retarded probably because of time wasted in identifying the essentials, use of a

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clumsy storage and retrieval system, and tendency to high distractibility. Furthermore, Goodstein (1971) found that the higher IQ EMR children did not sustain performance superior to low IQ EMR children in the presence of a distractor. This may be a substantiation of the findings of Orton (1964) that EMR children habitually employ a rote learning process rather than learning by principle. On the basis of such findings it behooves educators to manage optimally the learning environment.

Educators should not confuse techniques which facilitate learning, such as the six techniques that Sesame Street has apparently borrowed from TV ads, and learning itself. Sesame Street has demonstrated the effectiveness of certain attention-getting techniques in facilitating the learning of information or concepts by children--techniques also used in TV ads. The profound difference between it and TV ads lies in the nature of what is being taught. The program is teaching "important" material, such as the alphabet, which can be built upon later and which has something to do with making children "ready" for school and its academic environment. Commercials are teaching something which has no value beyond themselves, except to the advertisers. No problems are posed which require solution; relatively little reasoning and thinking is involved. While it can be seriously questioned whether TV ads, given their substance, help children to learn per se, the techniques of TV ads facilitate learning of something, and so they can be used as a valid learning tool. This is the third implication.

The fourth implication is concerned with the simplicity of ads and repetition. Three mutually exclusive arguments invite controversy: (1) If the level of advertising content is so low that it "insults the intelligence of the average child," then it is wasteful. (2) If ads are

too simple and unstimulating, normal children would show less positive memory and DI than EMRs, and gifteds would show less positive memory and DI than normals. (3) If ads are too simple and unstimulating, they should be processed equally by all three groups; if so, the "lowest common denominator" (EMRs) has been reached, and waste would occur both for the normals and gifteds, based upon their relatively larger capacities to process information. The controversy is meaningless, for an alternative explanation may apply. The EMRs may have been measured after they had caught on to the task (at which point there is no statistical difference between retardates and normals). This may have been the case, since it is probable that many EMRs were watching the same ads since January or before. Unless one begins at zero and measures Ss after each series of exposures, one cannot demonstrate that the message is too simple. The same results could be obtained with a sophisticated message to which the children had been exposed a maximum number of times. Therefore, the alternative explanation is "overkill" in the sense of visual and auditory bombardment of children by primarily rote messages distributed over days and over time within those days. There are at least two interacting variables--complexity of message and practice--both of which must be manipulated if one wants to say anything definitive about either. Perhaps advertisers need to reduce the number of repetitions rather than increase the complexity of the message in order for their ads to be more memorable for the more intelligent. Educators would be wise to follow the same procedure in teaching gifted children. It is suggested that classroom experimentation be done before accepting this guideline as final, however.